City of San Jose

Sustainable Energy Policy

2003-04 Action Plan
March 2003

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

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Executive Summary

The City of San José Sustainable Energy Policy report provides background information on the energy usage and activities within San Jose. It clearly identifies current energy programs within San Jose and provides a description of those activities.

The current and future challenges that face our community are presented in order to understand the potential risks and threats surrounding energy issues. Finally, this document presents recommendations for meeting those challenges as the City's proposed goals and policy directions. An action plan for activities in FY2003-04 is presented, along with proposed longer-term actions.

Energy planning is necessary to find ways to manage today's urban energy needs without jeopardizing the needs of future generations. Sustainable urban energy policies encompass more than energy efficiency and energy conservation measures: they must be diverse, flexible, renewable and integrated.

Since local governments make decisions affecting land use, building codes, transportation systems, waste disposal, and power plants—all of which impact energy resource use—local jurisdictions can do much to ensure their own sustainable energy future.

The development and implementation of policies that support sustainability is both beneficial and cost effective for cities. A dollar spent on energy usually leaves the local economy rapidly, bound for domestic or foreign energy suppliers; however, a dollar spent on energy conservation measures will likely support local businesses by providing energy efficiency services as well as benefiting the environment. The annual savings gained by making the city's own operations more energy-efficient can potentially save millions of dollars that may be more appropriately applied to other essential City services.

The proposed goals for the San José Sustainable Energy Policy are to:

1. Lead by Example in pursuing the most efficient use of energy in City facilities and activities.
2. Explore opportunities to improve energy reliability, supply and price stability to meet current and future needs
3. Promote collaboration on energy issues
4. Promote and achieve a cleaner and healthier environment, including improving air quality and reducing greenhouse gas emissions
5. Encourage the development and use of renewable energy sources and alternatives fuels

Introduction

Why Energy Planning Now?

The City of San José recognizes an urgent need to proactively shape its energy future. In recent years, California has faced energy shortages and significant energy price increases. Unfortunately, the reality of future energy shortages and price uncertainty is still very present as power plant development has slowed greatly in 2002, and power transmission systems in the Bay Area continue to threaten inadequate service during peak energy use.

In addition, The City of San José is dedicated to being part of the answer to global warming and to reducing its dependence on fossil fuels for both environmental and economic, as well as security reasons.

Equally crucial, the City of San José, as part of its Sustainable City Plan, is dedicated to creating a sustainable energy future. To that end, this document is designed to compliment and update the energy component of the Sustainable City Plan as detailed within San Jose's General Plan: *San Jose 2020*.

Currently, the City has several policies related to energy. These policies can be found in the:

- General Plan
- Sustainable City Plan
- Green Building Policy
- Smart Growth Policy
- Smart Energy Plan
- Alternative Fuels Policy
- Cool Communities Initiative

(See appendix II for detailed descriptions of these policies)

Statement of Purpose

While drafting this energy policy, the City developed the following Statement of Purpose:

The purpose of the San José Sustainable Energy Policy and Action Plan is to create a Community where energy is generated and used in the most sustainable manner possible. This document supports the development of an infrastructure that values energy conservation and efficiency, energy reliability, reasonable and predictable energy costs, and the creation of clean, local energy sources.

City Facility Energy Use

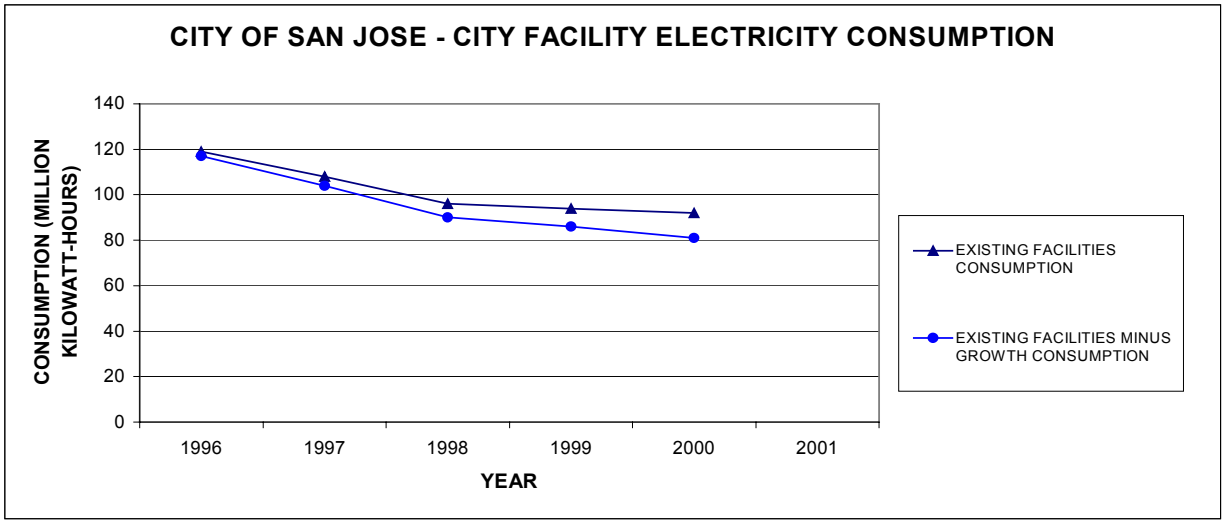
The City of San José has implemented energy efficiency projects for many years. From the installation of energy efficient streetlights and traffic signals, and the purchase of alternative fuel fleet vehicles, to the implementation of major efficiency projects at the City's water treatment plant and convention center, San José has been a leader in energy efficiency.

> ***"I believe Silicon Valley should become more energy self-sufficient. San José can lead a collaborative effort to find smart energy solutions that balance supply and conservation."***
> *Mayor Ron Gonzales, from the Smart Energy Plan 2001*

- In 2001, the City re-emphasized energy efficiency with Council's adoption of the Smart Energy Plan. As a result of this plan, from April 2001 to December 2002, the major City-owned facilities saved approximately 43.3 million kilowatt-hours, or 14.48% compared to the established baseline. Using the average July 2001 rate of $0.1255 per kilowatt-hour, the major facilities reduced expenditures by over $5.43 million since April 2001. For the same period, the small facilities saved over 2 million kilowatt-hours, resulting in $267,000 in reduced expenditures by using the citywide average July 2001 rate of $0.1313 per kilowatt-hour. (See figure 1 below).

(See appendix III for more demographic and energy data)

Figure 1



Energy Prices and Supply

California experienced serious energy supply, price and reliability problems starting in the summer of 2000. Citizens, businesses and government took numerous steps in response to those problems. In fact, California's residents and businesses achieved significant reductions in their electricity consumption. Those electricity demand reductions helped the state avoid the forecasted summer of 2001 blackouts and supply disruptions.

Although the energy crisis was very visible in the summer of 2001, the events of September 11, 2001 and the economic downturn, both within the Silicon Valley and the state, have moved the energy crisis from the front pages of most California newspapers. However, the crisis is not over: PG&E is still in hearings regarding its bankruptcy. Planned new construction of power plants has declined with twenty-two projects totaling 5,046 megawatts withdrawn since 2000.

> ***"Federal Energy Regulatory Commission reported in August 2002 that net generations additions would be 3,100 megawatts in California, thousands less than promised 18 months ago."***
>
> *Projections 2002- Silicon Valley, Silicon Valley Manufacturing Group*

The future of California's energy outlook is, at best, uncertain. A November 2002 report from the Bay Area Economic Forum on California's energy future indicates that conservation levels are already deteriorating as citizens, businesses and local governments are focusing on other issues. By their estimate, conservation levels dropped by one-third from 2001 to 2002. In addition, Silicon Valley's peak load is back to its year 2000 levels, after a 9% reduction in 2001. The Forum report also points to other key energy trends and issues:

- California's energy prices, already one of the highest in the country, continue to rise, threatening to drive business out of the state and reduce the quality of life for Californians (figure 2).
- Power supply and reliability in California is unstable.
- The current low level of investment in generation and transmission facilities could lead to another power crisis

The California Energy Commission also outlines some key energy trends related to natural gas supply in their December 2002 assessment report on natural gas supply and infrastructures issues:

- Electric generator demand for natural gas is driving growth in natural gas demand throughout the United States
- Between 2002 and 2012, supplies of natural gas are likely to be sufficient but more

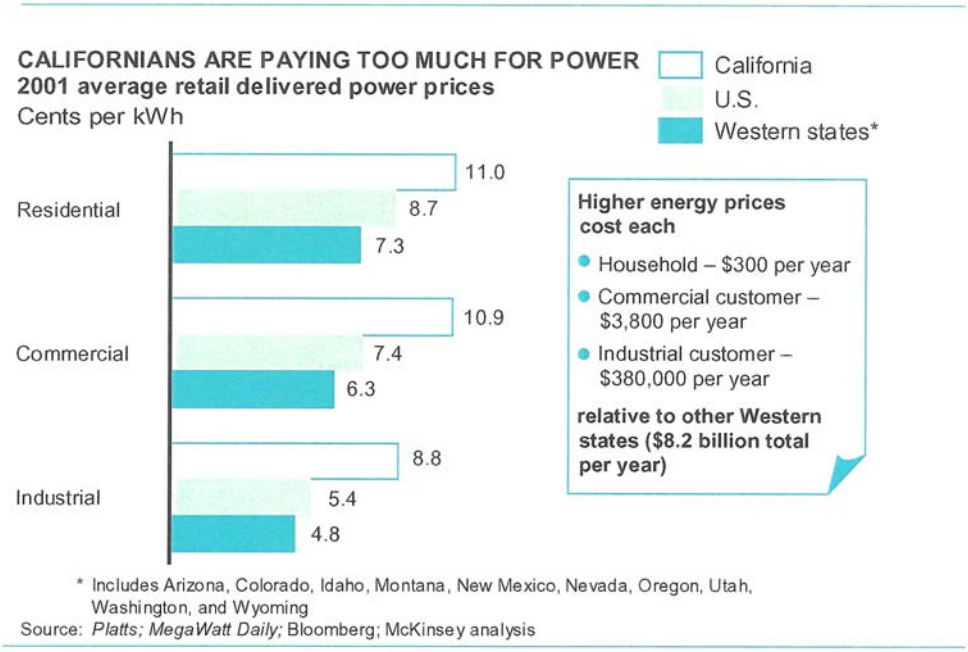
costly. The demand for natural gas is increasing throughout North America, but supplies are not as plentiful as anticipated in the 2002 assessment.

– Prices for natural gas will likely rise faster than inflation due to gas demand growth and the expense of developing new gas wells and pipeline capacity

A February 2003 draft report from the California Energy Commission, titled "California Energy Demand 2003-2012 Forecast" indicates a more positive energy outlook. For example, the draft report projects there will be an electricity rate decrease for residential customers between 2003-2012 of approximately 10%.

These conflicting forecasts for California's energy future coupled with great uncertainties in the national economy and world affairs indicate the need for sustainable energy planning at all levels. By encouraging the development of renewable energy and energy efficiency as outlined in this Energy Policy and Action Plan, the City of San Jose can help mitigate the impacts of unstable energy prices and supply well into the future.

Figure 2



Reprinted from "California's Energy Future: A Framework for an Integrated Power Policy", November 2002, Bay Area Economic Forum

Energy Goals and Policies

The City of San José, as part of its Sustainable City Major Strategy and General Plan, is dedicated to creating a sustainable energy future. The City of San José has been a leader in sustainable energy planning for over 20 years. As early as 1978 and again in 1989, San José stressed the importance of energy conservation in policies designed to increase efficiency within city facilities and to promote energy conservation and efficiency throughout the community. Development of the 2002 Sustainable Energy Policy and associated action plans ensures that the City effectively plans for the future and continues its energy leadership.

The proposed goals for the San José Sustainable Energy Policy are to:

1. **Lead by Example in pursuing the most efficient use of energy in City facilities and activities.**
2. **Explore opportunities to improve energy reliability, supply and price stability to meet current and future needs**
3. **Promote collaboration on energy issues**
4. **Promote and achieve a cleaner and healthier environment, including improving air quality and reducing greenhouse gas emissions**
5. **Encourage the development and use of renewable energy sources and alternatives fuels**

Detail on each of the proposed goals, along with the supporting policies follows.

Goal I. Lead By Example In Pursuing The Most Efficient Use Of Energy In City Facilities and Activities

The cheapest energy is energy not used. By continuing to invest in energy efficiency measures San José will reap the following benefits:

- Reduced energy costs due to reduced energy use
- Increased reliability due to reduced demand on the grid
- Reduce greenhouse gas emissions from fossil fuel power plants

Policies:

I.A. Maximize opportunities for saving energy in all new city facilities, and city-funded projects through strategies such as building automation systems, building orientation considerations, daylighting and lighting controls and efficient lighting, cool roofs and mechanical systems

I.B. Maximize opportunities for saving energy in all existing city facilities through strategies such as building automation systems, lighting controls and efficient lighting, cool roofs and mechanical systems

I.C. Increase energy innovativeness by implementing creative energy projects and financing mechanisms

I.D. Educate San Jose residents, businesses and schools about the multiple benefits of energy efficiency and renewable energy

I.E. Ensure that the City's Environmentally Preferable Purchasing Policy includes guidelines for purchasing energy efficient equipment and appliances

Goal II. Explore Opportunities To Improve Energy Reliability, Supply And Price Stability To Meet Current And Future Needs

Policies:

II.A. Work with the community and other public and quasi-public agencies to ensure energy supply reliability and price stability *(Council-adopted 11/00)*

II.B. Use innovative approaches to gain greater control of the City's energy future and retain more financial investment within the community

Legislation signed by the Governor Davis in 2002 (AB117/Migden) will allow for two new opportunities in the area of energy services. One aspect of the bill would authorize customers and community choice aggregators to aggregate the electrical load of interested electricity consumers within its boundaries. A community choice aggregator is defined as an entity such as a city or county whose governing board elects to combine the loads of its residents, businesses, and municipal facilities in a community-wide electricity buyers' program

The bill also authorizes entities, such as community choice aggregators, to apply to the California Public Utility Commission (CPUC) to become administrators for cost-effective energy efficiency and conservation programs. These programs are funded as a result of the California "public goods charges" (PGC). These funds come from a surcharge on California utility bills within the Independently Owned Utilities' (IOU) regions (Pacific Gas and Electric, Southern California Edison, San Diego Gas and Electric and Southern California Gas Companies).

Both of these sections of the adopted legislation present significant opportunities for the City of San José to gain greater control of the City's energy future.

II.C. Continue to identify appropriate locations in the region for appropriate new power plants that will protect our economy *(Smart Energy Plan--Council-adopted 3/2/01)*

II.D. Consider small – clean – and green – power plants that can be built faster and relieve demand on the power grid *(Smart Energy Plan--Council-adopted 3/2/01)*

II.E. Work with local and state agencies to ensure that power generation facilities are built in a manner that does not significantly impact environmental resources *(Council-adopted 11/00)*

Goal III. Promote Collaboration On Energy Issues

Policies:

III.A. Create and sustain partnerships to promote joint action to achieve citywide energy goals

III. B. Work with various community, business and governmental organizations to promote sustainable energy policies

III. C. Support local, state and federal legislation and regulation that provides for the goals of this energy plan

III. D. Promote San Jose as a city of choice for manufacturers of clean energy technologies

By exploring economic development incentives and opportunities in support of clean energy technology manufacturing, the City will stimulate sustainable development in a rapidly growing field that could provide a wide range of jobs and services within the community.

Goal IV. Promote And Achieve A Cleaner And Healthier Environment, Including Improving Air Quality And Reducing Greenhouse Gas Emissions

Policies:

IV.A. Reduce petroleum consumption in municipal fleets through improvements in fleet fuel efficiency, the use of highly efficient and alternative fuel vehicles and alternative fuels

The City of San Jose has a program to purchase alternatively fueled vehicles whenever appropriate and when resources are available. Currently, the City has 246 alternatively fueled vehicles. The City of San Jose vehicle fleet includes natural gas, methanol, electric and hybrid vehicles. In addition, the City has included the purchase of alternative vehicles as part of the Recycling and Street Sweeping contracts.

IV.B. Encourage reduced petroleum consumption in the private sector through improvements in fleet fuel efficiency, the use of highly efficient and alternative fuel vehicles and alternative fuels

Vehicle emissions are the single largest source of air pollution in the Bay Area. The City is committed to reducing vehicle emissions in order to reduce the negative health impacts of poor air quality to its most vulnerable citizens: children, the elderly and those with respiratory illnesses. These health impacts equal millions of dollars in lost productivity and medical costs in the Bay Area alone. The City also acts as the coordinator for the South Bay Clean Cities Coalition (SBCCC). The fifteen SBCCC public and private sector partners have been successful in expanding their respective fleets with more than 600 natural gas vehicles, 169 electric and 33 CNG vehicles. Since 1994, the City and the SBCCC have sponsored several educational events and workshops for fleet managers and the general public.

IV.C. Support and expand the City's Smart Growth policies which lead directly to improved air quality through reduced vehicle miles traveled

Smart Growth policies reduce vehicle miles traveled by orienting new development to nearby transit facilities and urban corridors with existing access to public transit.

IV.D. Reduce the urban heat island effect through the adoption of Cool Communities' actions

Cool Communities policies (such as tree planting, cool pavements and cool roofs) are designed to mitigate the urban heat island effect and to increase energy efficiency. An urban heat island is an urban area that can be 8-10 degrees warmer than the surrounding country-side due to the ground-level heat absorbing and heat generating properties of dark pavements and roofs, automobiles, industrial processes, etc. Cool communities initiatives help reduce and mitigate these heat absorbing/generating properties, resulting in less energy used to cool cities, as well as reduced air pollution, and increased comfort and property values.

Goal V. Encourage The Development And Use Of Renewable Energy Sources And Alternative Fuels

Policies:

V.A. Expand the use of renewable energy technologies or sources within city facilities and within city activities

V. B. Encourage the development of renewable energy sources and alternative fuels and cooperate with other public and quasi-public agencies in furthering this policy (Adopted San Jose General Plan-*Natural Resources)*

V. C. Pursue the purchase of electricity from renewable energy sources *(Council adopted 11/00)*

Energy Action Items

The following actions were explored as a result of the following:

- Input and recommendations from the stakeholders, both internal to the City and external stakeholders;
- Analysis of current city energy actions, programs and activities (results and funding resources); and
- Analysis of potential energy programs based on research of other national, state and local energy programs.

A prioritization based on an analysis of costs, staff resource needs and resultant benefits was then conducted.

1. Reduce energy consumption in city facilities by 12% for FY03-04 (baseline 1999-2000)

In June 2002, Mayor Gonzales increased the electricity conservation goal from 10% to 12% within City facilities. To comply with Policy Goal # 1, City Departments shall continue the aggressive conservation effort through the next fiscal year, and staff shall coordinate with energy engineering consultants to conduct comprehensive auditing of citywide facilities to identify energy efficiency improvements. Consultant reports shall be used for future capital proposals

Priority: High

Recommendation: FY2003-04 Action

2. Ensure the purchase of energy star products and other energy efficiency items as part of the City's Environmentally Preferable Purchasing (EPP) Policy

In order to ensure that the EPP Policy is creating the maximum benefit in terms of energy savings potential, energy staff from ESD and/or Public Works shall work with the General Services Purchasing Division to review and enhance where necessary EPP language relevant to energy consuming products. Consistency with the current budget strategy would be assured.

Priority: High

Recommendation: FY2003-04 Action

3. Ensure that all personnel who work with energy equipment or are involved in energy-related decisions will receive training for implementing the energy goals and policies

Citywide staff education from City management must continue on a seasonal basis (summer and winter) to remind staff of conservation goals and policies. Specifically, training could include a presentation to General Services and other relevant staff regarding sustainability policy and "green" measures related to utilities, fuels, etc.

Priority: High

Recommendation: FY2003-04 Action

4. Develop incentives for city departments who save energy

A barrier often facing Departments that invest in energy efficiency measures is that the energy cost savings achieved results in reduced allocations for subsequent energy budgets. Therefore, the City shall develop an incentive mechanism that will direct some of the energy cost savings to the department responsible for those savings. This will encourage additional future savings and provide increased employee satisfaction.

Priority: High

Recommendation: FY2003-04 Action

5. Explore opportunities for Community Choice and community aggregation, as outlined in AB117/Migden signed by Governor Davis.

Analyze the opportunities as outlined in AB117. Participate in the CPUC hearings and process to develop the rules and procedures for establishing community choice, and the administration of the energy efficiency programs. Collaborate and partner within the community and the region.

Priority: High

Recommendation: FY2003-04 Action

6. Develop alternative work schedules and telework policies where practicable and beneficial to the City and its employees in order to reduce transportation sector energy use

Alternative work schedules (AWS) and telework policies have many potential benefits. Both policies:

- Reduce vehicle miles traveled by employees thus reducing air pollution
- Increase employee satisfaction by reducing drive time thus increasing quality of life

Teleworking can lead to:

- Reduced use of City facilities and equipment thus reducing the city's operating costs
- Increased employee satisfaction by increasing flexibility of work location and/ or time

Priority: Low

Recommendation: Hold

> *FACT: Taking public transit or some alternative to driving alone just one day a week can cut San José's dirty air by 20% during the workweek.*

7. Develop a tree planting ordinance for parking lots as part of the City's Cool Communities Initiative

A tree planting ordinance will enhance existing tree planting guidelines as outlined in the General Plan. Tree planting ordinances have been shown to:

- Reduce heat load absorbed by asphalt due to shading. This reduces surface temperatures and the cooling needs of surrounding vehicles and buildings
- Cool air temperatures by evapotranspiration which can reduce ozone concentrations on hot summer days
- Reduce the amount of impervious surface in parking lots, which can

reduce polluted runoff and the size, and costs of storm water facilities - Parking lot runoff has relatively high concentrations of trace metals, oil and grease (Center for Urban Forest Research, January 2002)

Priority: Low

Recommendation: Hold

8. Set a goal to install 5 renewable energy systems on city facilities by December 2008

The City will analyze standard and alternative public financing opportunities such as State incentive programs and bonds in order to finance these projects. An analysis was recently conducted by the National Renewable Energy Laboratories of the potential for solar electric systems on several city facilities. That analysis reported the potential for energy savings that would result from the installation of solar on the following sites: General Services Administration building, South and Maybury Yards, and possibly one or more of the CIP projects association with the City's Library and Parks Bonds. Staff is working to further identify resources for both the design/project management and installations of these recommended systems. The installation of renewable energy systems on City facilities will:

- Reduce peak demand
- Reduce O/M costs for city facilities
- Improve air quality
- Reduce greenhouse gas emissions
- Demonstrate the City's commitment to being an energy leader

Priority: High

Recommendation: FY2003-04 Action

9. Explore the development of a Solar Access Ordinance for use in new development, expanding on the current Solar Access Guideline

The City has a Solar Access guideline as part of the City's Residential Design Guidelines. Staff will evaluate a recent study of the effectiveness of the Solar Access guideline in order to make recommendations to better implement the guideline. Staff will also explore the potential for strengthening this guideline, identify the potential benefits, and work with stakeholders on this recommendation.

Priority: Medium

Recommendation: FY2003-04 Action

10. Provide incentives for manufacturers of renewable energy within city limits

Staff will work with the Office of Economic Development to explore the potential for the City to provide incentives for the manufacturers of renewable energy systems and components. These firms could provide additional job opportunities for city residents.

Priority: Medium

Recommendation: FY2003-04 Action

11. Identify and implement opportunities for educating the public about energy efficiency and renewable energy

Continue the energy efficiency and renewable energy education programs established in partnership with PG&E's Pacific Energy Center based on funding availability. Identify and pursue additional funding sources such as grants and partnerships to expand energy efficiency and renewable energy educational offerings.

Priority: High

Recommendation: FY2003-04 Action

Energy Policy-Action Item Matrix—Potential Actions for 2003-04

Action Item	Priority*	Applications			Support Goals					Benefits	Potential Resources
		C	R	B	1	2	3	4	5		
1. Reduce energy consumption in city facilities by 12% for FY03-04 (Baseline 1999-2000)	**H**	✓			✓		✓	✓		– Improve air quality – Reduce greenhouse gas emissions – Increase facility O/M savings	– Capital Improvement Program funds – California Energy Commission
2. Purchase energy star products and other energy efficiency items as part of the City's Environmentally Preferable Purchasing (EPP) Policy *(Consistent with current budget strategy)*	**H**	✓			✓		✓	✓		– Improve air quality – Reduce greenhouse gas emissions – Increase facility O/M savings	– Potential no net cost to City – Use of ongoing funds allocated for City purchases
3. Ensure that all personnel who work with energy equipment or are involved in energy-related decisions will receive training for implementing the energy goals and policies	**H**	✓			✓		✓	✓		– Improve air quality – Reduce greenhouse gas emissions – Increase facility O/M savings	– State Public Goods Benefits funds – Utility training funds (PG&E) – Other state energy training funds
4. Develop incentives for city departments who save energy	**H**	✓			✓	✓	✓	✓		– Improve air quality – Reduce greenhouse gas emissions – Increase facility O/M savings	– Use of City interdepartmental energy team to identify incentives
5. Explore opportunities for Community Choice and community aggregation, as outlined in AB 117/Migden signed by Governor Davis	**H**	✓	✓	✓	✓	✓	✓	✓	✓	– Increased control over energy future – Access to funds – Improved energy efficiency throughout the community	– Allocation of staff (Environmental Services, Attorney's office)
6. Develop alternative work schedules and telework policies where practicable and beneficial to the City and its employees	**L**	✓			✓			✓		– Improve air quality – Reduce greenhouse gas emissions – Increase employee satisfaction	– Allocation of staff to research opportunities

*Priority Rankings were determined based on an analysis of costs, staff resource needs, and resultant benefits

Energy Policy-Action Item Matrix—Potential Actions for 2003-04

Action Item	Priority*	Applications			Support Goals					Benefits	Potential Resources
		C	R	B	1	2	3	4	5		
7. Develop a tree planting ordinance for parking lots as part of the City's Cool Communities Initiative	**L**	✓		✓			✓	✓		– Improve air quality – Reduce greenhouse gas emissions – -Reduce storm water runoff	– Allocation of staff to identify opportunities, impacts and present recommendations
8. Set a goal of five renewable energy systems on city facilities by December 2008	**H**	✓			✓			✓	✓	– Improve air quality – Reduce greenhouse gas emissions – Reduce peak demand	– California Power Authority Funds – Third Party/Private funds – Tax-Exempt Financing
9. Explore the development of a Solar Access Ordinance for use in new development, expanding on the current Solar Access Guideline	**M**		✓				✓	✓	✓	– Improve air quality – Reduce greenhouse gas emissions	– Allocation of staff to identify opportunities, impacts and present recommendations
10. Provide incentives for manufacturers of renewable energy within city limits	**M**			✓		✓	✓		✓	– Increase manufacturing and business opportunities – Increase job opportunities	– Allocation of staff to identify opportunities, impacts and present recommendations
11. Identify and implement opportunities for educating the public about energy efficiency and renewable energy	**H**	✓	✓	✓	✓		✓	✓	✓	– Well educated public – Increase energy efficiency throughout the community – Reduce peak demand	– California Public Utility Commission/ Public Goods Benefits Funds – California Energy Commission – Utility Collaboration – Department of Energy – Other grants as identified

H = High C = City
M = Medium R= Residents
L = Low B= Businesses

1 - Lead by Example in pursuing the most efficient use of energy in City facilities and activities.
2 - Explore opportunities to improve energy reliability, supply and price stability to meet current and future needs
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Appendix I

Stakeholder Workshops

Introduction

During the fall of 2002, the City of San José's Environmental Services Department (ESD) hosted three stakeholder workshops to gather input for this Sustainable Energy Policy and Action Plan. The first workshop, on October 10, was for internal stakeholders from City departments. The second workshop, on October 17, was geared towards business, industry and external government stakeholders. The third workshop on October 24, was geared towards community stakeholders.

Workshop Format

The workshops began with Mary Tucker, Senior Environmental Services Specialist within ESD, reviewing the meeting agenda, in addition to introducing herself, other staff and the project's consultant, Carey Hamilton. At this time meeting participants were asked to introduce themselves to the group.

Next Ms. Hamilton provided a brief overview of the policy development process and asked that all participants please provide feedback throughout the workshop as the policy document was being reviewed. The bulk of the workshops were composed of a thorough review of the goals, policies and action items included in the plan as well as describing the thinking and history behind these components of the plan.

Several participants asked questions and provided comments throughout the document review process. In addition, at the end of the review all participants were asked to rank the action items in order of importance. The participants were also given an opportunity to provide additional comments about the value of the workshops and the policy development process in general.

In addition to the workshops, individual meetings were held with key organizations. Several dozen stakeholders were also sent the final draft document for comment in late December. Comments provided from workshop participants and all other stakeholders have been reviewed and incorporated where appropriate into the policy document.

Appendix II

San Jose's Energy Policy History

Background

The City of San José has been a leader in sustainable energy planning for over 20 years. As early as 1978 and again in 1989, San José stressed the importance of energy conservation in policies designed to increase efficiency within city facilities and to promote energy conservation and efficiency throughout the community.

The following sections outline existing City of San José energy policies.

Energy Policies in the 2020 General Plan- Revised in 2001

A. Energy Use

A1 Roads, building and landscaping for new residential projects should be designed and oriented to maximize energy conservation benefits for space heating and cooling to the extent feasible. (*Community Development)*

A2 Roads, building and landscaping for new commercial projects should be designed and oriented to maximize energy conservation benefits for space heating and cooling to the extent feasible. *(Community Development)*

A3 Roads, Building and landscaping for new Industrial project should be designed and oriented to maximize energy conservation benefits for space heating and cooling to the extent feasible. *(Community Development)*

A4 Private development should include adequate landscaped areas. Landscaped areas should utilize water efficient plant materials and irrigation systems. Energy conservation techniques such as vegetative cooling and wind shielding should also be utilized. All landscaped areas should include provision for ongoing landscape maintenance. *(Community Development)*

A5 Incorporate good designs, foster aesthetics and promote usable open space, and encourage use of alternative energy sources and energy conservation techniques in residential development. *(Housing)*

A6 As part of the rehabilitation of existing housing units, the installation of insulation and other retrofit techniques should be promoted to reduce energy (*Housing)*

A7 Promote the cooperation of public and private sectors of the economy to expand housing opportunities and provide housing which is adequately insulated and reasonable energy efficient. (*Housing)*

A8 The City should encourage the selection of trees appropriate for a particular urban site. Tree placement should consider energy saving values, nearby power lines and root characteristics. *(Natural Resources)*

A9 The City's design techniques include provisions for solar access for siting structures to maximize natural heating and cooling, and for landscaping to aid passive cooling protection from prevailing winds and maximum year-round solar access. *(Natural Resources)*

A10 The City should encourage owners and residents of existing developments to implement programs to use energy more efficiently in building and in their transportation choices to reduce dependency on automobiles and to explore alternative energy sources. (*Transportation)*

B. Land Use and Energy

B1 When changes in residential densities are proposed, the City should consider such factors as neighborhood character and identity compatibility of land uses and impacts on livability, impacts on services and facilities including schools, accessibility to transit facilities, and impacts on traffic levels on both neighborhood streets and major thoroughfares.*(Community Development)*

B2 Residential subdivisions should be designed to provide for internal circulation within neighborhoods, prevent through vehicle traffic from traversing neighborhoods and bicycle connections encourage pedestrian and between neighborhoods and to adjacent commercial uses and transit facilities. *(Community Development)*

B3 Consideration should be given to the siting of homes for privacy, livability, and adequate solar access and wind conditions. Siting should take advantage of scenic views but should not create significant visual impacts affecting public places and other proprieties. *(Community Development*)

B4 Pedestrian travel should be encouraged as a viable mode of movement between high-density residential and commercial areas. Also throughout the City and in activity areas such as schools, parks, transit stations, and in urban areas, particularly the Downtown Core Area and neighborhood business districts, by providing safe and convenient pedestrian facilities. *(Services and Facilities)*

C. Land Use, Energy and Transportation

C1 The City should cooperate with the Santa Clara County Transit District, the California Department of Transportation and other transportation agencies to achieve the following objectives for the county's public transit system:

- Provide all segments of the City's population, including the handicapped elderly, youth and economically disadvantaged with adequate access to public transit.
- Public transit should be designed to be an attractive, convenient, dependable and safe alternative to the automobile.
- Enhance transit service in major commute corridors, and provide convenient transfers between public transit systems and other modes of travel**.**
- Develop an efficient and attractive public transit system which meets the travel demand at major activity centers, such as the Downtown, major employment centers, major regional commercial centers, government offices and colleges and universities

C2 Privately owned transit systems, such as taxicabs and private bus companies, should be encouraged to provide convenient transfers to and from public transit systems

C3 The City should encourage State and Federal legislation and programs to develop and promote viable alternative power sources to the internal combustion engine. *(Services and Facilities)*

C4 The City should promote the installation of High Occupancy Vehicle (HOV) lanes on State highways, freeways and county expressways. *(Services and Facilities)*

C5 The City should cooperate with the Santa Clara County Transit District, Cal Train and other appropriate transit agencies in the development of park and ride lots to support public transit. (*Services and Facilities)*

C6 The City should continue its participate in inter-jurisdictional approaches, such as the Santa Clara County Congestion management Agency, to develop and implement appropriate techniques to improve the regional transportation system. *(Services and Facilities)*

C7 Multiple occupancy vehicles should be afforded such incentives as preferred parking space location and reduced parking fees. *(Services and Facilities)*

C8 A bikeway system linking residences employment centers, schools, parks and transit facilities should be developed to promote the use of the bicycle as a n alternative mode of transportation for commuting as well as for recreational purposes. *(Services and Facilities)*

C9 Light rail stations and other public transit embarkation points should include secure and convenient bicycle parking facilities. *(Services and Facilities)*

C10 Bicycle parking facilities that are secure and convenient should be an integral component of such activity centers as major public facilities, business and employment sites and shopping centers. *(Services and Facilities)*

C11 The energy efficiency of proposed new development should be considered when land use and development review decisions are made. *(Natural Resources)*

D. Energy Use and Municipal Operations

D1 All streetlight in areas outside of the Downtown Core Area should use the low-pressure sodium vapor.

Within the Downtown Core Area, high-pressure sodium vapor streetlights should be used. *(Natural Resources)*

D2 The City should require low-pressure sodium vapor lighting for outdoor, unroofed areas in all new developments and encourage existing development to retrofit using low-pressure sodium vapor lighting. *(Natural Resources)*

D3 The City should continue to pursue energy efficiency in city operations. *(Natural Resources)*

E1 The city should encourage the development of renewable energy sources and alternative fuels and cooperates with other public and quasi-public agencies in furthering this policy. (*Natural Resources)*

E2 Methane gas may be recovered from a closed solid waste landfill irrespective of the land use designation of the site. *(Aesthetic Cultural Recreational Resources)*

Sustainable City Plan

In September 1989, City Council adopted the Sustainable City Strategy. This strategy aims to reduce energy use in all sectors through the use of five approaches: education and persuasion, technical and design assistance, financial incentives, municipal operations, and policy and regulation. These techniques were used successfully to achieve energy savings throughout the 1990's.
The Sustainable City Plan's Status Report 1998, comprehensively addresses progress on energy issues, including many measures that have been taken over the past several years to significantly reduce energy use in San Jose, from the installation of energy efficient street lights and traffic signals, and the purchase of alternative fuel fleet vehicles, to the implementation of major efficiency projects at the City's water treatment plant.

Smart Growth Policy

To affect change in the private sector, the Planning Department has embarked on an ambitious Smart Growth plan that among other goals aims to provide residents better access to mass transit, and to bring housing a jobs into closer proximity. These efforts will improve air quality in San Jose by reducing vehicle miles traveled, while at the same time making San José more attractive to both potential residents and potential businesses.

Green Building Program

In June 2001, City Council adopted Green Building Policies as developed by the members of the community with the input of City Departments. The citywide policy on green building was developed to demonstrate the City's commitment to environmental, economic, and social stewardship, to yield cost savings to the city taxpayers through reduced operating costs, to provide healthy work environments for staff and visitors, and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, the City hoped to provide leadership by setting a community standard of sustainable or "green" building.

Recognizing the importance of integrating energy strategies in buildings to reduce operations costs, reduce pollution, and enhance occupant comfort, the City adopted the following Green Building Policy goals for building energy performance.

- *Minimum Energy Performance*: establish the minimum level of energy efficiency for the base building and systems.
- *Optimized Energy Performance*: achieve increasing levels of energy performance above the minimum standard to reduce environmental impacts associated with excessive energy use.
- *Building Commissioning*: verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.
- *Measurement and Verification*: provide for the ongoing accountability and optimization of building energy performance over time.
- *Renewable Energy*: encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

In addition to committing to improve the energy performance in all its own buildings, the City has sponsored a variety of educational opportunities for the community, so they too can learn how to implement smart energy strategies. Since the year 2000, the City has sponsored a Green Building Educational Program delivering workshops and

seminars on green building and energy related issues to the general public in an effort to educate private sector participants involved in owning, designing and constructing buildings. In addition, since the beginning of 2002, the City has collaborated with PG&E's Pacific Energy Center (PEC) to provide a variety of additional energy performance related workshops. The Green Building Program plans to continue to nurture this successful partnership with the PEC with hopes to increase the number of course offerings in San José and to provide local energy design related services in the future.

Smart Energy Plan

In 2001, the City re-emphasized energy sustainability in response to the energy crisis by passing the Smart Energy Plan. Goals in this plan include promoting creative solutions to the energy crisis by spearheading collaboration among regional stakeholders, reducing energy use at City facilities by 10%, identifying new power plant locations, expanding the City's program for energy efficient buildings, considering clean distributed generation opportunities, and setting clear predictable standards for clean local generation within the City's jurisdiction.

As a result of the Smart Energy Plan, from April 2001 to December 2002, the major City-owned facilities saved approximately 43.3 million kilowatt-hours, or 14.48% compared to the established baseline. Using the average July 2001 rate of $0.1255 per kilowatt-hour, the major facilities reduced expenditures by over $5.43 million since April 2001. For the same period, the small facilities saved over 2 million kilowatt-hours, resulting in $267,000 in reduced expenditures by using the citywide average July 2001 rate of $0.1313 per kilowatt-hour.

Additionally, Certain City facilities reduced energy use by 20 percent or more and qualified for the state's 20/20 rebate program, which offered a 20 percent rebate on electricity invoices to those achieving this level of reduction. Together, City of San José employees garnered some $76,700 in rebates in 2001.

In addition, after the passing of the Smart Energy Plan the City supported the Metcalf energy facility planned for South San Jose. Several other energy generation projects are currently planned or have started construction within San Jose. The City has also led two major Energy Summits, which resulted in increased collaboration on energy issues in the region.

San Jose Smart Energy Plan:

1. Silicon Valley energy summits – where we will work with other local governments and our communities to explore regional solutions and opportunities.
2. Identify appropriate locations in the region for new power plants that will protect our economy – and will protect our neighborhoods and protect our environment. We will ask our neighboring cities to do the same
3. Explore creative energy partnerships among cities – or with the state –or with the private sector, to ensure reliable supplies – for our residents and for our businesses.
4. Lead by example. We will reduce our energy needs through vigorous conservation efforts. Joining with other regional cities, and ask everyone in San Jose to do their best to cut their energy use by 10 percent. We at City will make a 10% cut happen.
5. Expand our model program for energy-efficient buildings.
6. Consider small – clean – and green – power plants that can be built faster and relieve demand on the power grid. We can locate them in our industrial areas – not in residential neighborhoods.
7. Set clear predictable standards for clean local generation, within our authority. And we will streamline our City's review and approval of appropriate power projects so they can be built quickly.

Cool Communities

Cool Communities policies are designed to mitigate the Urban Heat Island effect— when urban areas are 6-10 degrees warmer than the surrounding countryside due to the heat storing properties of urban surfaces (pavements, roofs, etc). By mitigating the urban heat island effect Cool Communities policies reduce energy use and reduce air pollution that results from extreme summer temperatures. In addition, some Cool Community policies, such as tree planting and green roofs can increase both

quality of life and property values while reducing urban runoff.

In 2001, the City through a grant from Pacific Gas and Electric provided a Cool Roof Incentive Program as part of a Cool Communities initiative for eligible building owners in San José. Cool Roofs save energy by reflecting the sun's heat energy thus reducing building temperatures and air-conditioning loads. During the eight months that the program was in place, the City provided $122,720 in incentives to 18 businesses in San José resulting in an estimated energy savings of 185 peak kW demand.

Cool Communities actions in addition to tree planting, such as installing cool roofs, green roofs, cool pavements, and permeable pavements, should be reviewed in future years as potential action items.

Solar Projects

The City of San Jose participates in the Bay Area Solar Consortium (BASC) which is the Million Solar Roofs Initiative (MSRI) Partnership for the San Francisco and Monterey Bay areas. The Consortium is comprised of more than 50 businesses, local, state and federal agencies, schools, utilities, unions and educational entities who are dedicated to expanding the use of solar energy and "green" power within the region. The goals of BASC are:

- To support the development and use of solar energy in the San Francisco and Monterey Bay areas;
- To align the resources and capabilities of the consortium members to install 5,000 solar energy systems within the Bay Area by the year 2010;
- To develop a strategy for addressing barriers to the use of solar energy; and
- To develop and implement an action plan for the installation of solar technologies within the Bay areas.

Through the BASC partnership, 320 systems for a total of almost 3.8 MW have been installed in the Bay Area to date.

Million Solar Roofs Initiative

Announced in June 1997, Million Solar Roofs (MSRI) is an initiative to install solar energy systems on one million U.S. buildings by 2010. The initiative includes two types of solar technology: solar electric systems (or Photovoltaics) that produce electricity from sunlight and solar thermal systems that produce heat for domestic hot water, space heating, or heating swimming pools. The U.S. Department of Energy, through its Regional Offices, focuses its efforts on national, state and local partnerships. These partnerships are made up of the building industry, other federal agencies, local and state governments, utilities, energy service providers, the solar energy industry, financial institutions, and non-governmental organizations. The goal is to remove market barriers to solar energy use and develop and strengthen local demand for solar energy products and applications.

MSRI, however, does not provide funding to design, purchase or install solar energy systems.

To learn more about the Million Solar Roofs Initiative (MSRI), please visit the Million Solar Roofs website at http://www.millionsolarroofs.org.

Alternative Fuels

Emissions from the transportation sector are the single largest source of air pollution in California. As a result, the City of San José has made reducing emissions from the City fleet of vehicles a priority. In particular, San Jose has made significant investments in alternative fuel and energy efficient vehicles and has spearheaded fleet vehicle clean fuel policy in the South Bay for several years through the South Bay Clean Cities Coalition. The City of San José has a total of 245 alternative fuel vehicles.

City of San Jose – Alternative Vehicles

Compressed Natural Gas (Light & Heavy Duty	82
Electric Vehicles	17
Methanol	8
Hybrids	2
Electric scooters, carts, etc.	117
Propane	19
	245

Low Income Energy Assistance Program

In June of 2001, the Council established a one-time allocation of funds to be used to establish community programs such as the County Home Energy Assistance Program and Emergency Contingency Funds (currently administered for the County by Economic and Social Opportunities—ESO). These programs are designed to provide relief for the increased costs of gas and electricity that fall more greatly on older residents and those with low incomes.

Specific goals had been established for the San José Home Energy Assistance Program. The following table details the achievements within those goals.

PROGRAM	GOAL	*ACTIVITY/ACHIEVEMENT*
Home Energy Assistance – Emergency Assistance	Provide financial assistance in the form of a credit on a qualified utility customer's account for	▪ Total number of households assisted between July 2001 and April 2002: 1,191
Energy Educational Workshops	Provide 12 Workshops in collaboration with the City of San José	▪ Fifteen (15) workshops have been conducted. ▪ ESO staff continue to coordinate workshop and energy educational outreach with the Strong Neighborhoods Initiative ▪ In-home energy assessment/educational visits conducted: 106
Weatherization Services	Provide energy conservation/efficiency services to 110 households	▪ Total Number of households assisted to date: 106
Renewable Energy Pilot Project	Conduct a pilot project to test the viability of providing solar hot water heating systems for lower income households.	▪ Negotiations ongoing to determine feasibility of pilot, best possible location for pilot project. Discussions ongoing with potential sites, including eligible senior housing, family shelter, or day care.

Environmentally Preferred Purchasing Policy

In 1990, the City Council adopted a Council Policy on "Source Reduction and Recycling Procurement" that was quite innovative at the time and comprehensive in the way it addressed the use of recycled paper. The City has continued its focus on environmental leadership through policy development and program design via the Environmental and Utility Services City Service Area (CSA).

The latest step was the adoption of a Council policy in September 2001 covering "Environmentally Preferred Purchasing (EPP)."

Essentially, by considering environmental impacts in public purchasing, the City of San José can reduce its burden on the local and global environment, remove unnecessary hazards from its operations, protect public health, reduce costs and liabilities, and potentially improve the environmental quality of the region. This policy is an effective way to direct the City's effort in procuring environmentally preferable products and services.

The primary purpose of the EPP policy is to minimize negative environmental impacts by ensuring that the City uses services and products that:

- reduce toxicity;
- conserve natural resources, materials, and energy;
- maximize recyclability and recycled content.

Additionally, EPP supports the market for recycled goods and other environmentally preferable products and services.

Appendix III

SUMMARY: ENERGY GRANTS AWARDED TO THE CITY OF SAN JOSE

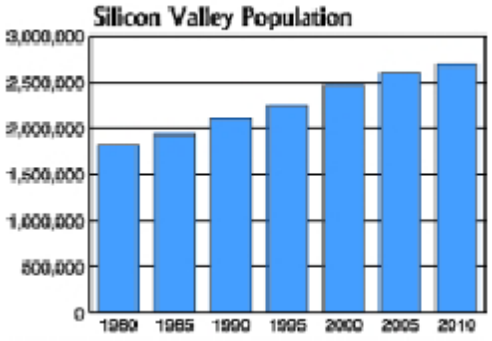
FUNDING AGENCY	GRANT AWARD AMOUNT	PROJECT	TIMEFRAME
U.S. Department of Energy—Urban Consortium Energy Task Force	$75,000	City-Utility Partnership to increase energy efficiency in commercial buildings	1992
"	$100,000	Sustainable City Policies Development	1992-1994
"	$75,000	Negotiating a Demand Side energy program with utilities	1992
California Energy Commission	$75,000	Fuels Cell and Cogeneration Research	1993
"	$50,000	Linking Municipal Policies and Practices on Energy and Land Use Planning	1994
U.S. Department of Energy—Urban Consortium Energy Task Force	$50,000	Creative Partnerships in Energy—Working with Small Business	1996
"	$100,000	Direct Access Electricity Procurement for Municipal Accounts	1998
"	$50,000	Using Renewable Energy for Local Governments	1998, 2000
Pacific Gas and Electric	$265,000	Cool Roofs Incentive Program	2002
Pacific Gas and Electric	$406,000	TEEM-UP Program—Energy Education & Outreach	2002
California Energy Commission/U.S. DOE	$20,000	South Bay Clean Cities Coalition—Alternative Fuels	2002
U.S. Department of Energy-Million Solar Roofs Program	$100,000	Public Education on Renewable Energy	2000, 2003

Appendix IV

Demographic and Energy Use/Generation Information

Silicon Valley Population Growth

Actual growth and projections for Northwest Santa Clara County, Southern Alameda County, San Jose/Milpitas, Southwest Santa Clara County, Southern Santa Clara County, and Eastern Santa Cruz County



Population Projections for
San Jose/Milpitas:

1980:	728,006
1985:	791,000
1990:	877,884
1995:	945,720
2000:	1,042,136
2005:	1,094,176
2010:	1,129,448

Silicon Valley Projections 2000, Silicon Valley Manufacturing Group

Recent/Current Energy Generation Projects in San José

Los Esteros Power Plant
Calpine Corporation is currently building the Los Esteros Energy Center, a 180-megawatt power plant consisting of low-impact, natural gas-fired turbines. The plant was designed to support US Dataport's Silicon Valley Internet Campus, a host to internet servers for Silicon Valley. The power plant is under construction north of Route 237 and to the east of Zanker Road in North San José. The Dataport project has been delayed due to lack of demand for server farms, so the power plant will provide much needed local source of electricity that can be used by the rest of San Jose until the Dataport project is built. Los Esteros is scheduled to come online in early 2003.

Metcalf Energy Center
Calpine Corporation is also building a 600-megawatt natural-gas-fired, combined-cycle energy generation facility in South San José next to Monterey Highway near Metcalf Road. Construction is underway and the power plant is expected to be on line in 2004.

Moss Landing Power Plant
When Moss Landing was owned by PG&E, it generated 1510 megawatts of electricity A switch of ownership to Duke Energy in 1998 and a $525 million upgrade later, Moss Landing has been transformed into the largest natural-gas fired power plant in California with 2570 megawatt capacity - enough to power 2 to 2.5 million homes and 5 percent of California's total electricity on a high-demand day. The upgrade project, which took four years, replaced five older units that were shut down in 1995 with two natural gas-fired ones that are 75 percent cleaner, 30 percent more efficient, and uses 50 percent less cooling water per megawatt hour.

The Moss Landing Power Plant provides energy directly to San José through transmission lines to the PG&E substation near Metcalf Road and Highway 101.

PG&E's Nortech Substation
A substation that is currently being constructed in North San José along with upgrades to several miles of transmission lines will increase the flow of electricity into San José and Silicon Valley by 800 megawatts. This PG&E project, called the Nortech Substation, will extend a transmission line from the Newark substation into North San José. Even though the substation does not create new energy, it will provide a badly-needed channel in which electricity from California and western states can be delivered to San José and the rest of Silicon Valley.
Berryessa Sun, September 2002

Appendix V

Environmental Credo for the City of San José

The City of San Jose is committed to the concept of Sustainability in its management of environmental issues. Within the City's General Plan, the City's Sustainable City Major Strategy is a statement of San Jose's desire to become an environmentally and economically sustainable city. A "sustainable city" is a city designed, constructed, and operated to efficiently use its natural resources, to minimize waste, and to manage and conserve them for the use of present and future generations. The following eleven guiding principles constitute an "environmental credo" which should direct future City decisions on environmental matters in general. This credo was adopted by the City Council in 1996 as part of the adoption of the Water Policy Framework.

- San Jose embraces the concept of Sustainability.
  … *In short, this means the city should work to meet its existing needs without compromising the ability of future generations to meet their needs.*
- San Jose recognizes the mutual dependence of environmental quality and continued economic health.
  … *Economic vitality and environmental protection are not mutually exclusive. A healthy environment is integral to the long-term economic interests of our city. Likewise, a healthy economy will allow the City to champion and implement the programs and projects that will maintain and enhance our local natural environment into the future.*
- San Jose is committed to environmental equity.
  … *The City's environmental efforts must reach all segments of the community. The City should work to ensure that environmental requirements do not place inordinate and unfair burdens on any one sector of the City.*
- San Jose prefers prevention over cure.
  … *The City favors a prevention oriented approach to environmental management, rather than corrective action after the fact.*
- San Jose recognizes that an aware, responsible and involved community is the key to our success.
  … *The City's environmental efforts will fall short unless individual citizens, community-based groups, and businesses are involved.*
- San Jose recognizes its role and responsibility in the regional and in the global community.
  … *The City must continue to recognize, and act upon, the relationship between local environmental issues and the regional and global environment.*
- San Jose must practice what it preaches.
  … *Few things raise as much ire as when government entities fail to meet the same standards and regulations they impose on others. The City must avoid this double standard and act as a leader in environmental management.*

- Since San Jose cannot do everything at once, we must ensure that we do the right things first, and do them well.

  … *The City must develop and continually reevaluate its environmental priorities to ensure that it is making the best possible investments in San Jose's future.*

- Reducing risk is a main focus of San Jose's environmental policies and programs.

  … *The overarching goal of all the City's environmental actions and investments is to reduce the risks environmental problems pose to human health, the environment, the economy and the quality of life.*

- San Jose recognizes the value of continuing leadership in planning and implementing innovative and proactive environmental policies and programs.

  … *The City understands and values the encouragement it has received, from individual San Jose residents to international organizations, as a city that manages our environmental affairs well. Being a municipal environmental leader has value in that it has given residents, businesses and City employees a renewed sense of civic pride which fuels our desire to solve all our urban problems with enthusiasm, determination and cooperation.*

Appendix VI

Glossary of Terms

With the exception of the words “reliability”, “sustainable”, and “alternative fuel” the glossary definitions are from the Center for Renewable Energy and Sustainable Technology, the California Energy Commission, the Department of Energy, and the American Heritage Dictionary. A few definitions have been edited for grammatical reasons.

AGGREGATOR
An entity responsible for planning, scheduling, accounting, billing, and settlement for energy deliveries from the aggregator’s portfolio of sellers and/or buyers. Aggregators seek to bring together customers or generators so they can buy or sell power in bulk, making a profit on the transaction.

ALTERNATIVE FUEL
Means methanol, denatured alcohol and other alcohols, separately or in mixtures of 85 percent by volume or more (or other percentage not less than 70 percent as determined by U.S. Department of Energy rule) with gasoline or other fuels; Compressed Natural Gas (CNG); Liquefied Natural Gas (LNG); Liquefied Petroleum Gas (LPG); hydrogen; "coal-derived liquid fuels; " fuels "other than alcohols" derived from "biological materials; " electricity, or any other fuel determined to be "substantially not petroleum" and yielding "substantial energy security benefits and substantial environment benefits." 1

CONSERVATION
Steps taken to cause less energy to be used than would otherwise be the case. These steps may involve improved efficiency, avoidance of waste, and reduced consumption.

COOL ROOF
A roof with a reflective, non-metallic, often light-colored roof coating. Cool roofs are commonly used in climates that use air conditioning because dark colors absorb heat and light colors reflect heat. Roofs have intense solar heat gain (energy) because of their relatively flat exposure to the sun.

COOPERATIVE
A business entity similar to a corporation, except that ownership is vested in members rather than stockholders, and benefits are typically in the form of products and services.
Many rural and remote areas of the country are served by electric cooperatives formed to provide power to communities not served or under-served by utilities.

DIRECT ACCESS
The ability of a retail customer to purchase commodity electricity directly from the wholesale market rather than through a local distribution utility.

DISTRIBUTED GENERATION
A distributed generation system involves small amounts of generation for the purpose of meeting local loads and/or displacing the need to build (or upgrade) local distribution lines.

ENERGY EFFICIENCY
Using less energy/electricity to perform the same function. Programs designed to use electricity more efficiently—doing the same with less.

FOSSIL FUELS
Oil, coal, natural gas or their by-products. Fuel that was formed in the earth in prehistoric times from remains of living cell organisms.

FUEL
A material that is consumed, giving up its molecularly stored energy which is then used for other purposes, such as to do work (e.g., run a machine). A substance that can be used to produce heat.

FUEL CELL
A device or an electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes, thus producing electricity.

GREENHOUSE GASES
Substances that can adversely effect human health and the environment when they accumulate in the

atmosphere and trap radiant energy; they include sulfur dioxide, nitrous oxide, and carbon dioxide.

MUNICIPAL UTILITY
A provider of utility services owned and operated by a municipal government.

RELIABILITY
The provision of adequate and dependable generation, transmission, and distribution service. 2

RENEWABLES
Renewables are sustainable energy sources that cause relatively few environmental impacts and pose a low risk to human health. Renewables are sources that constantly renew themselves or that are regarded as practically inexhaustible. Renewables include, but are not limited to, technologies such as photovoltaic and wind power.

SOLAR ENERGY
Power produced by technology that collects heat and/or light radiated from the sun. Two common forms of solar energy are photovoltaic panels, which are semiconductors that directly generate electricity, and solar thermal plants, which use the sun to create steam to turn a turbine.

SUSTAINABLE
Sustainable means meeting the needs of the current generation without compromising the ability of future generations to meet their own needs. 3

WIND ENERGY
Electricity produced when wind power is captured by turbines and converted into electricity.

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1 This definition of "alternative fuel" is from the National Energy Policy Act

2 This definition of "reliability" is from the Center for Renewable Energy and Sustainable Technology.

3 The definition of "sustainable" is from the United Nations World Commission on Environment and Development.